Cosmic Chemistry: Understanding Elements

Module Planning Guide

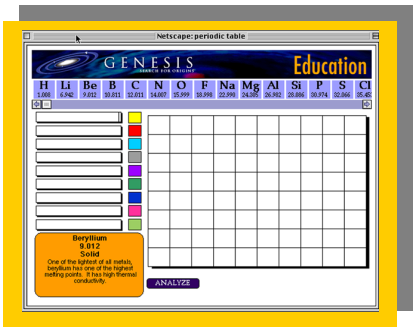
The Learning Cycle

Activity	Teacher Materials	Student Materials	Time approx.	Standards Addressed (5-8)	Process Skills
BRIEFING					
	• Teacher Text				
EXPLORATION					
• Exploration of a Problem: Making Sense of the Elements (without the computer)	• Teacher Guide • Element Exploration Modeling Cards • Overhead: "Prediction of Properties of an Unknown Element"	• Student Activity • User Quick Clicks	90 minutes	• Science as Inquiry • Physical Science • History and Nature of Science	• Observation • Inferences • Collecting Data • Interpreting Data • Interpolation • Classification • Communication • Variables • Research
• Modeling the Periodic Table: An Interactive Simulation (with the computer)	• Teacher Guide		90 minutes	• Same as Exploration of a Problem	• Same as Exploration of a Problem
DEVELOPMENT					
• Past, Present and Future	• Teacher Guide				
• A Historic Overview: Mendeleev and the Periodic Table	• Teacher Guide Supplement	• Student Text • Student Activity	45 minutes	• History and Nature of Science	• Research • Classification • Interpolation
• The Modern Periodic Table	• Teacher Guide Supplement	• Student Text • Student Activity	45 minutes	• Science as Inquiry • Physical Science	• Classification
• Elemental Mysteries for Genesis Scientists		• Student Text	30 minutes	• Science as Inquiry • Physical Science • History and Nature of Science	• Inferences • Research
INTERACTION/SYNTHESIS					
• Element Research	• Teacher Guide	• Student Activity	90 – 120 minutes	• Physical Science	• Research • Communication
ASSESSMENT					
• Connecting Models and Critical Questions	• Teacher Assessment Guide	• Student Assessment Activity	90 minutes	• Science as Inquiry • Physical Science	• Observation • Interpreting Data • Classification • Communication ▪Research

Materials lists for each teacher guide in this module.

Listed below is a quick reference to all of the teacher guides included in this module along with a complete listing of each guide's materials, for your convenience.

Interactive Simulation Teacher Guide:



For each group of three to four students:

- PC with Windows 95, or Power Macintosh
- Interactive Simulation: Modeling the Periodic Table
- Overhead of Prediction of Properties of an Unknown Element
- Copy of the modern periodic table
- Copy of Mendeleev's periodic table
- Student Activity, "Making Sense of the Elements"
- (Optional) "Successful Problem-Solving Process Log"
- (Optional) Album stamps from a music club, or list of albums of various styles

Making Sense of the Elements Teacher Guide:

For each group of three to four students:

- Set of 63 Element Exploration Modeling Cards with information about individual elements that Mendeleev worked with prior to 1870 (See Teaching Tools)
- Set of 3 Element Exploration Modeling Cards with information about elements discovered prior to Mendeleev's 1871 periodic table (See Teaching Tools)
- Overhead of Prediction of Properties of an Unknown Element (See Teaching Tools)
- Copy of the modern periodic table
- Copy of Mendeleev's periodic table
- Student Activity, "Making Sense of the Elements"
- (Optional) "Successful Problem-Solving Process Log"
- (Optional) Album stamps from a music club, or list of albums of various styles

Past, Present, and Future Teacher Guide:

For each student:

- Student Text, "A Historic Overview: Mendeleev and the Periodic Table"
- Student Activity: Questions and Strategies, "A Historic Overview: Mendeleev and the Periodic Table"
- Student Text, "The Modern Periodic Table"
- Student Activity: Questions and Strategies, "The Modern Periodic Table"
- Student Text, "Elemental Questions for Genesis Scientists"

For the teacher:

- Teacher Guide Supplement, "A Historic Overview: Mendeleev and the Periodic Table"
- Teacher Guide Supplement, "The Modern Periodic Table"

Element Research Teacher Guide:

For each student:

- Computer with Internet capability
- Student Activity, "Element Research"
- 11 x 14 poster paper
- Colored pencils or markers
- Periodic table of the elements

Connecting Models and Critical Questions Teacher Guide:

For each student (assessment will be done on an individual basis):

- Student Assessment Activity, "Connecting Models and Critical Questions"
- Calculator or computer
- Graph paper (see Teaching Tools)
- Pencils (colored pencils are also helpful)
- All activities and notes completed throughout module

Note to teachers: This "at-a-glance" planning guide, as well as the allocated time frames for the activities, are the result of classroom pilot test data. Please contact us with further suggestions as to how we can improve this guide to best meet your classroom needs at genesisepo@mcrel.org.